MEDIBUS for
Dräger Pediatric Devices

Instructions for Use

Contents

For Your Safety and that of Your Patients

For correct and effective use of the apparatus and to avoid hazards it is essential to read the following recommendations and to act accordingly:

Strictly follow the Instructions for Use

Any use of the apparatus requires full understanding and strict observation of these instructions. The apparatus is only to be used for purposes specified here.

Liability for proper function or damage

The liability for the proper function of the software protocol is irrevocably transferred to the owner or operator if the software protocol is used in a manner not conforming to its intended use.

Dräger cannot be held responsible for damage caused by non-compliance with the recommendations given above. The warranty and liability provisions of the terms of sale and delivery of Dräger are likewise not modified by the recommendations given above.

Dräger Medizintechnik GmbH

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Intended Use

MEDIBUS

MEDIBUS is a software protocol intended to be used by two medical devices for exchanging data and control functions via their RS 232 interfaces.

This part of manual describes device dependent supported commands and data sets, port hardware and configurations for Dräger Pediatric Devices.
For a general description of the protocol please refer to the Instructions for Use "Dräger RS 232 MEDIBUS Protocol Definition" (order-no. 90 28 258).

Any data transmitted via the MEDIBUS interface are intended only for information purposes and should not be used to derive therapeutical decisions.

Data Formats

The underscore character used in the format column in lists of measured data and alarm limits is transmitted as an ASCII "space" character (20H).

A '*' ahead the format indicates that the value may be negative. In that case a '–' character will appear at the first space of the respective format.

Be aware that in a small number of cases the used format for a certain item may be different!

Languages

Alarm phrases and text messages are given in the languages:

D	german	NL	dutch
GB	english	E	spanish
US	US-english	J	japanese
F	french	S	swedish
I	italien		

Alarm Phrases

Some alarm phrases contain abreviations as follows:
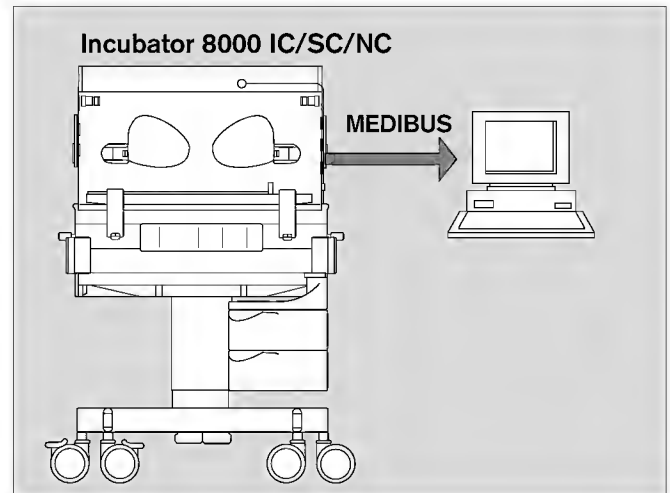
ASCII Short Form	Meaning
$&	LOW
"#	HIGH
'@	ALARM

Alarm Priorities

The alarm source is responsible for the priority.
The priority may be variable even if from the same source. (E.g. the priority may increase the longer an alarm is pending.)

MEDIBUS Specification for Incubator 8000 IC/SC/NC

Device Connection

Incubator 8000 IC/SC/NC

MEDIBUS

Port Specification

Connector
Type	RS-232-C
	9 pin Sub D (female)
Pins	1 Housing
	2 RXD
	3 TXD
	5 GND
Galvanic Isolation	1.5 kV
Location	rear side of Incubator 8000 IC/SC/NC
	Label: Baby Link®

To connect a PC to Incubator 8000 IC/SC/NC the "Medi-Cable" 83 06 488 is recommended.

Port Configuration
Baudrate	9600 Baud
Databits	8
Startbits	1
Stopbits	1
Parity	none

Device Identification

ID Number	Name	MEDIBUS-Version
8000	INCUBATOR 8000 SC/NC	03.00
8001	INCUBATOR 8000 SC/NC + 1 x SKIN	03.00
8002	INCUBATOR 8000 SC/NC + 2 x SKIN	03.00
8003	INCUBATOR 8000 IC	03.00
8004	INCUBATOR 8000 IC + 1 x SKIN	03.00
8005	INCUBATOR 8000 IC + 2 x SKIN	03.00

Available Data

Current Measured Data, Alarm status, Device settings
and text messages for Incubator 8000 IC/SC/NC are
available from version 1.00.

Commands

Transmitted Commands

Code	Command Specification
30H	Do nothing (NOP)
51H	Initialize Communication (ICC)
52H	Request Device Identification

Processed and responded Commands

Code	Command Specification
24H	Request current DATA
27H	Request current ALARMS
29H	Request current DEVICE SETTINGS
2AH	Request current TEXT MESSAGES
30H	Do nothing (NOP)
51H	Initialize Communication (ICC)
52H	Request Device Identification
55H	Stop Communication

Measured Data

Code	Data Description	Unit	Format
6CH	Air Humidity	%	_XX_
6DH	Air Temperature	°C	XX.X
C3H	Temperature 1	°C	XX.X
BEH	Temperature 2	°C	XX.X
F0H	Inspiratory O2-Concentration	%	XXX_

Temperature 1 = Core temperature
Temperature 2 = Peripheral temperature

Alarm Messages

Air Module

	PRIO 18	Problems with Fan	
CODE	D: LUEFTER INOP	GB: FAN ERR	F: VENT INOP
CAH	I: ERR VENTOLA	NL: VENT INOP	E: VENT INOP

	PRIO 20	Ambient Temp. > high Limit	
CODE	D: AMB TEMP "#	GB: AMB TEMP HI	F: AMB TEMP "#
30H	I: AMB TEMP "#	NL: AMB TEMP "#	E: AMB TEMP "#

	PRIO 20	Ambient Temperature Sensor inop	
CODE	D: AMB TEMP INOP	GB: AMB TEMP ERR	F: AMB TEMP INOP
48H	I: AMB TEMP INOP	NL: AMB TEMP INOP	E: AMB TEMP INOP

	PRIO 8	Ambient Temp. Setting Deviation > 1.5 °C	
CODE	D: AMB TEMP DIF	GB: AMB TEMP DIF	F: AMB TEMP DIF
6BH	I: AMB TEMP DIF	NL: AMB TEMP DIF	E: AMB TEMP DIF

	PRIO 3	Lock Setting Temperature > 37 °C active	
CODE	D: AMB TEMP > 37	GB: AMB TEMP > 37	F: AMB TEMP > 37
4EH	I: AMB TEMP > 37	NL: AMB TEMP > 37	E: AMB TEMP > 37

Skin Module

	PRIO 20	Temp. 1 – Probe disconnected or fault	
CODE	D: TEMP 1 INOP	GB: TEMP 1 ERR	F: TEMP 1 INOP
46H	I: ERR TEMP 1	NL: TEMP 1 INOP	E: TEMP 1 INOP

	PRIO 8	Temp. 1 – Setting Deviation > 0.5 °C	
CODE	D: TEMP 1 DIF	GB: TEMP 1 DIF	F: TEMP 1 DIF
6DH	I: TEMP 1 DIF	NL: TEMP 1 DIF	E: TEMP 1 DIF

O2 Module

	PRIO 20	O2 Sensor inoperable	
CODE	D: O2 SENS INOP	GB: O2 SENS ERR	F: CAPT O2 INOP
43H	I: ERR SENS O2	NL: O2–SENS INOP	E: SENS O2 INOP

	PRIO 8	O2 Setting Deviation > 5 %	
CODE	D: O2 DIF > 5 %	GB: O2 DIF > 5 %	F: O2 DIF > 5 %
70H	I: O2 DIF > 5 %	NL: O2 DIF > 5 %	E: O2 DIF > 5 %

	PRIO 3	Lock O2 Setting > 40 % active	
CODE	D: O2 > 40 %	GB: O2 > 40 %	F: O2 > 40 %
71H	I: O2 > 40 %	NL: O2 > 40 %	E: O2 > 40 %

Humidity Module

	PRIO 15	Humidity Sensor inoperable	
CODE	D: FEU SEN INOP	GB: HUM SENS ERR	F: HUM CAP INOP
34H	I: ERR UMI SENS	NL: HUM SEN INOP	E: HUM SEN INOP

	PRIO 7	Water Reservoir empty	
CODE	D: WASSERMANGEL	GB: WATER OUT	F: EAU FINI
9EH	I: ACQUA FINI	NL: WATER STOP	E: AQUA FALTA

Device Settings

Code	Data Description	Unit	Format
1CH	Air Humidity	%	__XX_
1AH	Air Temperature	°C	_XX.X
1BH	Temperature Skin	°C	_XX.X
01H	Inspiratory O2-Concentration	%	_XXX_

Text Messages

CODE 13H	D: Modul LUFT aktiv	GB: Module AIR active
	F: Module AIR actif	NL: Module LUCHT aktief
	I: Modo ARIA attito	E: Modo AERE activado

CODE 14H	D: Modul HAUT aktiv	GB:Module SKIN active
	F: Mode PEAU actif	NL: Module HUID aktief
	I: Modo PELLE attivo	E: Modo PIEL activado

CODE 15H	D: Modul O2 aktiv	GB:Module O2 active
	F: Module O2 actif	NL: Module O2 aktief
	I: Modo O2 attivo	E: Modo O2 activado

CODE 16H	D: Modul FEUCHTE aktiv	GB:Module HUM. active
	F: Mode HUMID actif	NL: Module HUMID aktief
	I: Modo HUMID attivo	E: Modo HUMID activado

Specification for Babytherm 8004/8010

Device Connection

Babytherm 8004/8010

MEDIBUS
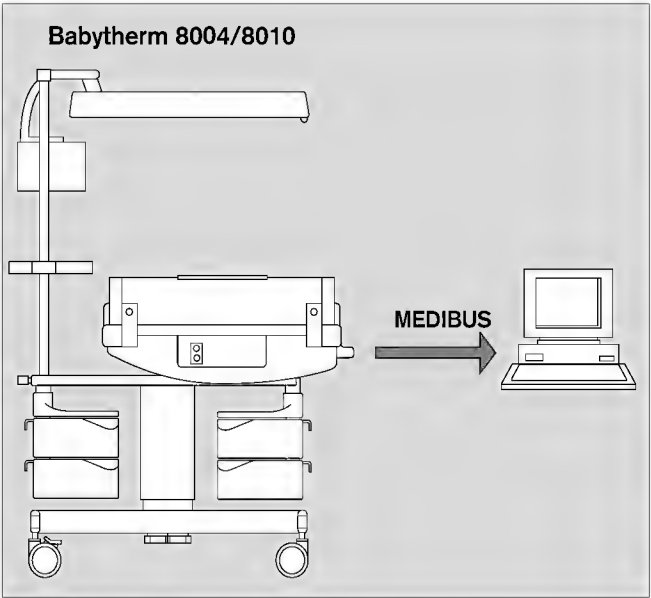
Port Specification

Connector
Type	RS-232-C
	9-polig, Sub D (female)
Stifte	1 Housing
	2 RXD
	3 TXD
	5 GND
Galvanic Isolation	1,5 kV
Position	rear side of Babytherm 8004/8010
	Label: Baby Link®

To connect a PC to Babytherm 8004/8010
the "MEDIBUS-Cable" (Sach-Nr.: 83 06 488) is recommended.

Port-Configuration
Baudrate	9600 Baud
Databits	8
Startbits	1
Stopbits	1
Parity	none

Gerätekennung

ID Number	Name	MEDIBUS-Version
8006	BABYTHERM 8004	04.00
8007	BABYTHERM 8010	04.00

Available Data

Current Measured Data, Alarm status, Device settings
and text messages for Incubator 8000 IC/SC/NC are
available from version 1.00.

Commands

Transmitted Commands

Code	Command Specification
30H	Do nothing (NOP)
51H	Initialize Communication (ICC)
52H	Request Device Identification

Processed and responded Commands

Code	Command Specification
24H	Request Current DATA
27H	Request current ALARMS (Codepage 1)
2EH	Request current ALARMS (Codepage 2)
29H	Request current DEVICE SETTINGS
2AH	Request current TEXT MESSAGES
30H	Do nothing (NOP)
51H	Communication initialized (ICC)
52H	Request Device Identification
55H	Stop Communication
4AH	Configure response characteristics
4BH	Set language version

Measured Data

Code	Data Description	Unit	Format
6AH	Mattress temperature	°C	XX.X
6BH	Radiant heater output	%	_XXX
C3H	Temperature 1	°C	XX.X
BEH	Temperature 2	°C	XX.X

Temperature 1 = Core temperature
Temperature 2 = Peripheral temperature

Alarm Messages

Skin Module (Codepage 1)

	PRIO 20	Temp. 1 – Probe disconnected or fault	
CODE	D: TEMP 1 INOP	GB: TEMP 1 ERR	F: TEMP 1 INOP
46H	I: ERR TEMP 1	NL: TEMP 1 INOP	E: TEMP 1 INOP

	PRIO 20	Temp. 2 – Probe disconnected or fault	
CODE	D: TEMP 2 INOP	GB: TEMP 2 ERR	F: TEMP 2 INOP
47H	I: ERR TEMP 2	NL: TEMP 2 INOP	E: TEMP 2 INOP

	PRIO 8	Temp. 1 – Setting Deviation > 0,5 °C	
CODE	D: TEMP 1 DIF	GB: TEMP 1 DIF	F: TEMP 1 DIF
6DH	I: TEMP 1 DIF	NL: TEMP 1 DIF	E: TEMP 1 DIF

	PRIO 11	Temp.1 > upper limit	
CODE	D: TEMP 1 "#	GB: TEMP 1 HIGH	F: TEMP 1 "#
CBH	I: TEMP 1 "#	NL: TEMP 1 "#	E: TEMP 1 "#

Mattress temperature (Codepage 2)

	PRIO 29	Mattress temperature > 40 °C	
CODE	D: MAT TEMP "#	GB: MAT TEMP HI	F: TEMP MAT "#
7CH	I: MAT TEMP "#	NL: MAT TEMP "#	E: TEMP MAT "#

	PRIO 29	Mattress temperature – sensor inoperable	
CODE	D: MT TEMP INOP	GB: MAT TEMP ERR	F: TEMP MT INOP
7DH	I: ERR TEMP COL	NL: MT TEMP INOP	E: ERR TEMP MAT

	PRIO 14	Mattress temperature – setting deviation	
CODE	D: MAT TEMP DIF	GB: MAT TEMP DIF	F: TEMP MAT DIF
7EH	I: TEMP MAT DIF	NL: MAT TEMP DIF	E: TEMP COL DIF

Radiant heater (Codepage 2)

	PRIO 17	Radiant heater after 15 mins. operation	
CODE	D: RH 15 MIN	GB: RH 15 MIN	F: RH 15 MIN
7FH	I: RH 15 MIN	NL: RH 15 MIN	E: RH 15 MIN

Device Settings

Code	Data Description	Unit	Format
1BH	Skin temperature	°C	_XX.X
3EH	Radiant heater output	%	__XXX
3FH	Mattress temperature	°C	_XX.X

Text Messages

CODE	Ventilation mode DS		
	D: Betriebsart DS	GB: Mode DS	F: Mode DS
12H	NL: Mode DS	I: Modo DS	E: Modo DS

CODE	Radiant heater is in manual mode		
	D : Strahlungsheizung manueller Mode	GB: Radiant Heater manual Mode	F: Radiateur thermique mode manuel
3BH	NL: Verwarming straler man.-mode	I : Radiatore modo manual	E: Radiador modo manual

CODE	Radiant heater is in skin temperature control mode		
	D : Strahlungsheizung Haut-Mode	GB: Radiant Heater Skin Mode	F: Radiateur thermique mode peau
3CH	NL: Verwarming straler huid-mode	I : Radiatore modo pelle	E: Radiador modo piel

CODE	Photo-therapy is on		
	D : Phototherpie an	GB: Photo Therapy on	F: Phototherapie en marche
3DH	NL: Fototherapie aan	I : Fototerapia inserira	E: Fototerapia con

MEDIBUS Specification for Babylog 8000/Babylog 8000 SC

Device Connection
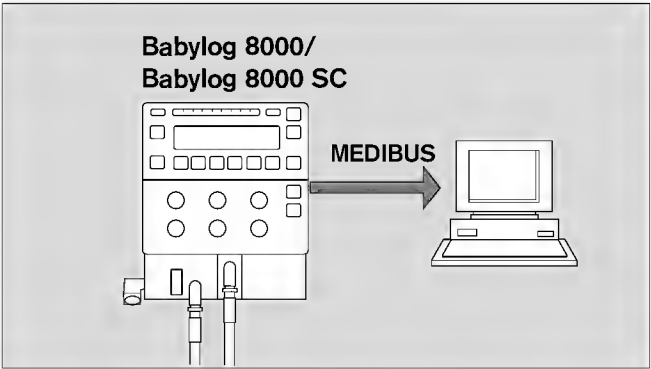
Port Specification

Connector
    Type   RS-232-C
                                     9 pin Sub D (female)
    Pins   1 Housing
                                       2 RXD
                                     3 TXD
                                     5 GND
    Galvanic Isolation   1.5 kV
    Location   rear side of Babylog 8000 /
                                     Babylog 8000 SC
                                     Label: RS 232
To connect a PC to Babylog 8000/Babylog 8000 SC the "Medi-Cable" 83 06 488 is recommended.

Port Configuration
    Baudrate   9600 Baud
    Databits   8
    Startbits   1
    Stopbits   1
    Parity   none

Device Identification

ID Number	Name	MEDIBUS Version
7000	BABYLOG 8000	03.00
7000	BABYLOG 8000 SC	03.00

Available Data

Data	Software versions Babylog 8000						
	2.00	3.00	3.02	4.02	4.03	4.04	following
Current Measure Data		X	X	X	X	X	X
Device Settings		X	X	X	X	X	X
Realtime Data			X	X	X	X	X
Languages D, GB, F, US, NL		X	X	X	X	X	X
Language E			X			X	X
Languages I, S, J						X	X

Data	Software versions Babylog 8000 SC		
	1.00	1.01	following
Current Measure Data	X	X	X
Device Settings	X	X	X
Realtime Data	X	X	X
Languages D, GB, F, US, NL	X	X	X
Language E		X	X
Languages I, S, J		X	X

The available languages are given for alarm phrases and text messages.

Commands

Transmitted Commands

Code	Command Specification
30H	Do nothing (NOP)
51H	Communication Initialized (ICC)
52H	Request Device Identification

Processed and responded Commands

Code	Command Specification
24H	Request current DATA
27H	Request current ALARMS
29H	Request current DEVICE SETTINGS
2AH	Request current TEXT MESSAGES
30H	Do nothing (NOP)
4AH	Configure Data Response
51H	Initialize Communication (ICC)
52H	Request Device Identification
53H	Request Real time Configuration
55H	Stop Communication

Measured Data

Code	Data Description	Unit	Format
73H	Mean Breathing Press.	mbar	*_XX_
78H	PEEP Breathing Press.	mbar	*_XX_
7DH	Peak Breathing Press.	mbar	*_XX_
80H	Gas Transport Coefficient	mL^2/s	XXXX
85H	Insp. mandatory Tidal Volume	mL	XXX_
86H	High frequency Tidal Volume	mL	XXX_
88H	Tidal Volume	mL	XXX_
B3H	Leakage	%	_XXX
B6H	Spontanous Fraction Min. Vol.	%	_XXX
B8H	Respiratory Minute Volume (high resolution)	L/min	X.XX
B9H	Respiratory MV (low resolution)	L/min	XX.X
BFH	Insp. mandatory Minute Volume	L/min	X.XX
D6H	Resp. Rate (Vol./Flow)	1/min	XXX_
F0H	Insp. O2	%	XXX_

*   Value can be negative. If so, '–' will be the first character.

Realtime Data

Code	Realtime Data	Unit
00H	Airway Pressure	mbar
01H	Flow (insp./exp.)	L/min

Alarm Messages

	PRIO 8	O2 Measurement inoperable	
CODE	D: FI O2 INOP	GB: % O2 ERR	F: FI O2 INOP
BEH	I: FI O2 INOP	NL: FI O2 INOP	E: O2 INSP INOP
	S: % O2 ERR	US: % O2 ERR	J: % O2 ERR

	PRIO 8	Flow Measurement inoperable	
CODE	D: FLOW INOP	GB: VOL ERR	F: SPIRO INOP
C1H	I: FLUSSO INOP	NL: FLOW INOP	E: FLUJO INOP
	S: VOL ERR	US: VOL ERR	J: VOL ERR

Device Settings

Code	Data Description	Unit	Format
01H	Insp. Oxygen	%	_XXX_
02H	Inspiratory Flow	L/min	XXX.X
03H	Expiratory Flow	L/min	_XX.X
05H	Inspiratory Time	sec	XX.XX
06H	Expiratory Time	sec	XX.XX
07H	I–Part T_I :T_E	–	_XX.X
08H	E–Part T_I :T_E	–	XXX.X
09H	Frequency IMV (SIMV)	1/min	XXX.X
0BH	PEEP/CPAP	mbar	_XX.X
11H	Apnea Time	sec	_XX.X
13H	Max. insp. Airway Press.	mbar	XXX.X
14H	Trigger Volume	mL	_XX.X
18H	High Minute Volume Limit	L/min	XX.XX
19H	Low Minute Volume Limit	L/min	XX.XX
1DH	Minute Volume Alarm Delay	sec	_XX__
2AH[1]	Frequency HFV	Hz	__XX_
2BH[1]	Amplitude HFV	%	_XXX_
40H[2]	set tidal volume VTset	mL	XXX.X
41H[2]	Alarm limit panting	bpm	XXX__

[1] Available since device version 4.02 for Babylog 8000.

[2] Available since device version 5.00 for Babylog 8000.

Textmessages

CODE 01H	D: Betriebsart IPPV	GB: Mode IPPV	US: Mode CMV
	F: mode VC	NL: mode IPPV	S: Mode IPPV
	I: Modo IPPV	E: Modo CMV	J: Mode CMV
CODE 03H	D: Betriebsart SIPPV	GB: Mode SIPPV	US: Mode A/C
	F: mode VAC	NL: mode SIPPV	S: Mode SIPPV
	I: Modo SIPPV	E: Modo A/C	J: Mode A/C
CODE 06H	D: Betriebsart SIMV	GB: Mode SIMV	US: Mode SIMV
	F: mode VACI	NL: mode SIMV	S: Mode SIMV
	I: Modo SIMV	E: Modo SIMV	J: Mode SIMV
CODE 0AH	D: Betriebsart CPAP	GB: Mode CPAP	US: Mode CPAP
	F: mode VS-PEP	NL: mode CPAP	S: Mode CPAP
	I: Modo CPAP	E: Modo CPAP	J: Mode CPAP
CODE 12H	D: Betriebsart DS	GB: Mode DS	US: Mode DS
	F: mode DS	NL: mode DS	S: Mode DS
	I: Modo DS	E: Modo DS	J: Mode DS
CODE 17H	D: Betriebsart VIVE	GB: Mode VIVE	US: Mode VIVE
	F: mode D.E.V.	NL: mode VIVE	S: Mode VIVE
	I: Modo VIVE	E: Modo VIVE	J: Mode VIVE
CODE 1BH	D: Betriebsart IPPV + HF	GB: Mode IPPV + HF	US: Mode CMV + HF 1)
	F: mode VC + HF	NL: mode IPPV + HF	S: Mode IPPV + HF
	I: Modo IPPV + HF	E: Modo CMV + HF	J: Mode CMV + HF
CODE 1CH	D:Betriebsart SIMV+HF	GB: Mode SIMV+HF	US: Mode SIMV+HF 1)
	F: mode VACI+HF	NL: mode SIMV+HF	S: Mode SIMV+HF
	I: Modo SIMV+HF	E: Modo SIMV+HF	J: Mode SIMV+HF
CODE 1DH	D: Betriebsart CPAP + HF	GB: Mode CPAP + HF	US: Mode CPAP + HF 1)
	F: mode VS-PEP + HF	NL: mode CPAP + HF	S: Mode CPAP + HF
	I: Modo CPAP + HF	E: Modo CPAP + HF	J: Mode CPAP + HF
CODE 3EH	D: Betriebsart PSV	GB: Mode PSV	US: Mode PSV
	F: mode AI	NL: mode PSV	S: Mode PSV
	I: Modo PSV	E: Modo PSV	J: Mode PSV
CODE 3FH	D: Betriebsart PSV+VG	GB: Mode PSV+VG	US: Mode PSV+VG
	F: mode AI+VG	NL: mode PSV+VG	S: Mode PSV+VG
	I: Modo PSV+VG	E: Modo PSV+VG	J: Mode PSV+VG
CODE 40H	D:Betriebsart SIMV+VG	GB: Mode SIMV+VG	US: Mode SIMV+VG
	F: mode VACI+VG	NL: mode SIMV+VG	S: Mode SIMV+VG
	I: Modo SIMV+VG	E: Modo SIMV+VG	J: Mode SIMV+VG
CODE 41H	D: Betriebsart SIPPV+VG	GB: Mode SIPPV+VG	US: Mode A/C+VG
	F: mode VAC+VG	NL: mode SIPPV+VG	S: Mode SIPPV+VG
	I: Modo SIPPV+VG	E: Modo A/C+VG	J: Mode A/C+VG

1) Available for Babylog 8000 since device version 4.02

$C \epsilon$ 0123
Directive 93/42/EEC
concerning Medical Devices